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ABSTRACT

Errors made in the allocation of federal funds to institutions for the three campus-based aid programs specified in Title IV of the Higher Education Act are discussed. Funds are allocated directly to participating colleges, which in turn award the money to students, for the following programs: Supplemental Education Opportunity Grants, College Work-Study, and National Direct Student Loans. Attention is focused on misallocation in the funds caused by misreporting of institutional enrollments on the form entitled the "Fiscal-Operations Report and Application to Participate" (FISAP). Error definitions and data collection problems are considered, and formulas for estimating need and allocation error are included. Potential errors were identified by comparing information submitted by about 250 colleges on the FISAP to comparable data submitted on other documents, particularly the Higher Education General Information Survey, and FISAPs for the previous year. For each institution with a FISAP enrollment error, recalculating the allocation for each campus-based program revealed a small overall change, with many institutions being unaffected. Information is also provided on the calculation of the national error levels, and recommendations for the U.S. Department of Education are included. (SW)

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ED254171

MISALLOCATION OF CAMPUS-BASED PROGRAM FUNDS RESULTING FROM FISAP ERROR

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December 21, 1984

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HE 018 137

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MISALLOCATION OF CAMPUS-BASED PROGRAM FUNDS RESULTING FROM FISAP ERROR

1.0 INTRODUCTION

Under Title IV of the Higher Education Act, money for three Campus-Based programs--Supplemental Education Opportunity Grants (SEOG), College Work-Study (CW-S), and National Direct Student Loans (NDSL) is allocated directly to participating institutions of higher education. These institutions, in turn, award the money to individual students to help them pay the cost of their postsecondary education. As part of the Title IV Quality Control Study, Advanced Technology, Inc., of Reston, Virginia, was contracted to study the extent to which errors are made in the institutional allocation of funds for each program. This paper is the last in a series of reports resulting from that task.

In this section of the report we summarize the allocation process and the purpose of the report and list the other reports which have been results of the FISAP error task. In section 2.0 we define the error we are evaluating, describe the problems we encountered in collecting the necessary data, and specify the limitations of the report. In section 3.0 we describe our estimation methods, present and analyze the error estimates, and recommend steps to reduce the error.

1.1 The Allocation Process

For each fiscal year, Congress appropriates money specifically for each of the three Campus-Based programs. Unlike some other student aid programs, Campus-Based aid is not an entitlement; neither individuals nor institutions have any statutory right to aid. Therefore, institutions must apply for funding annually to the U.S. Department of Education. They do this by submitting the "Fiscal-Operations Report and Application to Participate (FISAP)" in the Title IV programs. This form both provides the information needed to allocate the next year's appropriation and serves as a report on the use of the previous year's funds. (For instance, the reports submitted by October 1984 included applications for funds to award to students in the 1985-86 academic year and reports of funds spent in the 1983-84 academic year.) This paper concerns only the effects of errors in the parts of the FISAP used to determine how much money each school will receive.

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The allocation of funds to individual institutions is a four-step process. First, most of the national appropriation is divided among the states. Second, institutions that have been participating in the program receive "conditional guarantees" based on their funding levels in the 1979-80 program year. If the total of the conditional guarantees for all institutions in a state exceeds that state's allocation, institutional allocations are reduced proportionately and the allocation process for institutions in the state effectively ends. Institutions may also receive less than the conditional guarantee under some other circumstances, such as a high default rate in the NDSL program. If funds remain from the state allocation after all conditional guarantees in the state have been fulfilled, the excess is divided among the institutions so that their allocations will be more proportionate to their aggregate student need. Two different formulas are used to determine the aggregate need for aid of the students at an institution, one to allocate SEOG funds and one for the CW-S and NDSL programs. The final step is to allocate a national pool of funds among institutions to bring their allocations closer to the proportions their needs bear to the total of all institutional needs. However, in the year we are examining, 1983-84, there was no such national "fair share" money available.

Funds for each of the three programs are allocated separately; therefore, there are three different allocation formulas. These formulas differ because different amounts of money are appropriated for each program and because each program has unique features which must be included. For instance, the NDSL formula takes into account institutional collections and default rates, which do not exist in the SEOG and CW-S programs.

Only a few numbers from the FISAP are included in the allocation formulas. Total institutional income from tuition and fees is divided by the number of students to determine average tuition and fees separately for undergraduates and graduate students. Average tuition and fees is used with the number of eligible aid applicants in each of 60 income and dependency status categories to determine total self-help need. Institutions can err by misunderstanding exactly which data are required for the FISAP or by reporting the wrong numbers through transcription error. Any number derived through calculation using several FISAP data elements will be in error if any one of the elements is reported incorrectly.

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1.2 Rationale of This Report

This report concerns only misallocation of Campus-Based funds caused by misreporting of institutional enrollments on the FISAP. We discuss error definitions, data collection problems, and the limitations of this report in section 2.0. In section 3.0 we explain our methods of estimating allocation error, present the estimates, analyze the reasons for the errors, and suggest ways to reduce the error rates. All calculations assume that other factors in the allocation process remained constant.

Limitations on the resources available for data collection for this task determined how we would collect and analyze the data. Stage I of the Title IV Quality Control study examined a national sample of 275 institutions participating in the Campus-Based programs. Before our data collectors visited these schools, we compared elements of their FISAP's to comparable data on other documents they had also submitted, principally the Higher Education General Information Survey (HEGIS) and FISAP's for the previous year. Only when we found inconsistencies between the FISAP and HEGIS data for the same year or substantial cross-year changes did our data collectors investigate the FISAP data during their visits; their inquiries were limited to the problematic items. Therefore, we made no attempt to investigate internal institutional errors that were reported consistently on different Federal forms.

1.3 Other Reports on Error in the FISAP Process

This report is the last in a series of FISAP reports submitted to the Division of Quality Assurance, Office of Student Financial Assistance, U.S. Department of Education, under the Title IV Quality Control Study, contract number 300-84-0020. The earlier reports were:

- Analyses of Error Associated with the Application and Allocation Aspects of the Campus-Based Programs (February 27, 1984)
- Analysis of Error Associated with the Application and Allocation Aspects of the Campus-Based Programs: Results from Initial Data Collection (May 1984)
- Improving Quality in the Application Portion of the Processing Fiscal Operations Report and Application to Participate: An Approach to Developing and Refining Edit Checks (August 1984)

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- Analysis of Error Associated with the Application and Allocation Aspects of the Campus-Based Program: Plan for Remaining QC IV Stage I Analysis (October 1984)

The preliminary report submitted on October 5, 1984 (Error in the Campus-Based Program and GSL Certification Process: Flash Report) also included a chapter, "Preliminary Analysis of Error Associated with the Application Aspects of the Campus-Based Programs."

2.0 DEFINITIONS, PROBLEMS, AND LIMITATIONS

There is a large number of theoretical or possible errors within the FISAP process which could lead to misallocation of Campus-Based funds to institutions. However, data collection problems and other limitations of this study restricted its focus to a subset of these errors. Data collection problems and potential errors have been described more fully in previous reports, especially the May 1984 paper, and are only summarized here.

2.1 Definitions of FISAP Errors

Errors affecting the allocation of Campus-Based funds can be made by the institution, ED, and processing contractors. Institutional errors can be divided into conceptual errors and transcription errors. Staff at the institution responsible for compiling the data may misunderstand ED's requirements and definitions and may, therefore, include students or funds which should be excluded or omit students or funds which should be included. Institutions with branches or several campuses may be confused about whether to combine data from them or report on them separately. Often various offices contribute data; they may misunderstand even if the office which actually compiles and submits the report has the correct definitions. Once an institution has compiled the data for the FISAP--correctly or incorrectly--it can still make arithmatic or transcription errors when filling out the FISAP form itself. Moreover, after the school sends in its FISAP, ED or its processing contractor can lose or misfile it, enter data incorrectly onto magnetic tape, or make errors in editing the data or calculating the institutional allocations.

Most of these errors could not be detected with the resources and methodology of this study. Internal institutional errors, for instance, could only have been found by

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detailed, comprehensive audits of institutional records. Detection of data-processing errors would have required item-by-item comparisons of the FISAP's as submitted to the data entry contractor with machine-readable output. Therefore, for this study we considered differences between FISAP entries and comparable items on other reports to be potential errors, to be investigated during visits to the institutions which were intended pricipally to collect other data. "Other reports" included forms submitted in response to the Higher Education General Information Survey (HEGIS), reports on expenditures of aid under the Pell Grant program, and FISAPs for the previous year.

This approach produced a total of 83 potential errors or "discrepancies," as shown in Table 1 (a slight revision of Table 1 in the October 1984 report). We found all but 3 of the enrollment discrepancies by comparing FISAP and HEGIS data; we discovered 3 enrollment discrepancies and the other 23 discrepancies in tuition and fees receipts, Pell expenditures, and income of eligible aid applicants by comparing this year's data to the same items in the previous year. Most of these discrepancies were resolved during the institutional visits, but 27 were not. Of these, four were based on cross-year data. Although they had not been resolved, even large yearly changes were not considered conclusive evidence of an error. On the other hand, in the remaining cases of enrollment error, institutions clearly had not followed instructions to transfer onto the FISAP specific items from their HEGIS reports. Therefore, the errors being analyzed in this report **consist of failure to report the correct enrollment data.**

2.2 Data Collection Problems

The number of errors which could be analyzed for this report was limited by several practical data collection problems. The results of some of these problems can be seen in Table 2 in the difference between "Discrepancies Identified for Review" and "Responses Received" and in the four cases of "Discrepancies Not Resolved" which did not involve enrollment data. Other problems prevented even the initial identification of discrepancies.

Problems preventing identification of discrepancies included missing data and differences in definitions. For some schools, the relevant alternative data source, such as one of the HEGIS surveys, was not available. Moreover, HEGIS coverage is not complete--many proprietary, private nonprofit, and regional vocational-technical

TABLE 1

ERRORS ASSOCIATED WITH THE APPLICATION PORTION OF THE FISAP: SELECTED STATISTICS

Discrepancy Items	Number of Discrepancies Identified For Review	Responses Received[a]		Comparisons		Discrepancies Resolved		Discrepancies Not Resolved	
		Number	Percent	Cross-Source	Cross-Year	Number	Percentage	Number	Percentage
Enrollment[b]	60	52	88%	54	3	29	56%	23[c]	44%
Tuition and Fees	8	8	100	3	5	5	63	3	38
Pell Expenditures	7	6	75	3	0	6	100	0	0
Eligible Applicant Income	8	6	75	0	6	5	83	1	17
TOTAL	83	72	84	56	14	45	63	27	38

[a] Of 83 institutions identified for item discrepancy resolution, 61 provided information on 70 discrepancies.

[b] Of total enrollment discrepancies, all but three were generated by comparisons to HEGIS.

[c] The enrollment discrepancy for one institution was both cross-source and cross-year. It was counted as one separate error, with one resolution.

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schools do not file HEGIS forms. For these schools, there was either no alternative data source or a source on which the data could have different definitions. Data also had to be considered missing when FISAP and HEGIS were completed for different reporting units, such as different combinations of schools, branches, or campuses of a university. Finally, FISAP's themselves were missing for 25 of the 275 institutions.

Field data collection problems also hindered the analysis. Some institutions were unable to respond to inquiries about discrepancies because the only knowledgeable staff or the necessary documents were not available at the time of the visit. A few of the 275 sampled institutions did not participate in the Title IV Quality Control Project for reasons unrelated to the study of FISAP error.

2.3 Limitations of This Report

Because of the problems discussed in the two preceding sections, only limited use can be made of the data we collected on FISAP allocation errors. In the next chapter we discuss how we estimated national error levels and present and analyze our estimates. The estimates are, however, restricted to the allocation consequences of just one of the several potential FISAP errors: not reporting the same student enrollment data on the FISAP as on the HEGIS Fall Enrollment report. Since the estimates here deal with error attributable to only one of several variables in the allocation algorithm, they must be interpreted as partial estimates of the total amount of error in the allocation process.

The second caution which must be emphasized is that the existence of "error" in allocation of Campus-Based funds does not at all imply that elimination of this error would lead to any cost savings for the Federal government. The allocation process is an iterative one designed to distribute all available funds to participating institutions on the basis of student need. Errors cause some institutions to receive more money to distribute to their students than they would otherwise while other institutions get less. Elimination of this error would lead to a different distribution of funds, closer to the policy intent which the regulations and allocation formulas express, but not to any reduction in expenditures.

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3.0 FISAP ALLOCATION ERROR

Within the limitations described in the preceding section, we recalculated the allocation for each Campus-Based program to each sample institution with a FISAP enrollment error. The overall change was small, with many of the institutions being unaffected. We also estimated the change in aggregate need resulting from FISAP enrollment error.

3.1 Methods of Estimating Need and Allocation Error

We estimated allocation error by substituting the correct (HEGIS) enrollment data for the information submitted on the FISAP and following the effects of this change through the allocation formula for each school. We then multiplied each allocation change by the institution's weight and summed the weighted changes to produce a national estimate.

Enrollment data are not used in the allocation formula directly. Rather, institutions also report total income for tuition and fees, which ED divides by the number of students to find the average tuition and fees paid. Therefore, if an institution reported fewer students on the FISAP than on the HEGIS Fall Enrollment form, correcting the enrollment data upward corrected average tuition and fees paid downward; conversely, reducing the enrollment raised the average tuition and fees. Any change in tuition and fees can affect the aggregate student need on which institutional allocations are based by changing the average student's cost.

The SEOG need formula for institution i is

$$N_i = \left[.75(T_{iu} + L)A_{iu}\right] - F_{iu} - P_i - S_{iu} - .25(I_{iu})$$

where

N = Need

T = Average tuition and fees

L = Average living cost, set at $3200 for 1983-84

A = Number of eligible aid applicants

F = Aggregate expected family contribution

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P = Pell expenditures

S = Expenditures of state aid

I = Institutional aid expenditures

and u indicates elements applying to or derived from undergraduates only. Therefore, the formula for need adjusted for FISAP enrollment error, N'_i (primes indicate recalculated elements), is simply

$$N'_i = \left(.75(T'_{iu} + 3200)A_{iu}\right) - F_{iu} - P_i - S_{iu} - .25(I_{iu})$$

Recalculating self-help need for the CW-S and NDSL recalculations was more difficult. Self-help need is the sum of the self-help needs in 15 income categories of independent and dependent undergraduates and graduate students, or 60 categories for institutions with post-baccalaureate students. Within a category, the self-help need is the number of eligible aid applicants in the category multiplied by the lesser of cost (average tuition and fees plus the $3200 allowed for living costs) minus a constant expected family contribution for all aid applicants in the category; or by 25 percent of cost. However, categorical self-help need may never be less than zero. Therefore, the formula for a self-helped need at institution i for student type j (where j is u for undergraduates or g for graduates) in income group k with dependency status l (where l is d for dependent students and e for independent students) is:

$$N_{ijkl} = n_{ijkl}\left(\max\{0;\min\{(T_{ij} + 3200 - E_{jkl});(.25(T_{ij} + 3200)\}\}\right)$$

where

n = Number of eligible aid applicants in category

E = Standard EFC for students in category

Therefore,

$$N'_{ijkl} = n_{ijkl}\left(\max\{0;\min\{(T'_{ij} + 3200 - E_{jkl});(.25(T'_{ij} + 3200)\}\}\right)$$

and

$$N'_i = \sum_{jkl}\sum\sum N'_{ijkl}$$

Having calculated need change for the sample institutions with error, we could estimate the total need error among all institutions particpating in the Campus-Based programs. We multiplied the change in each institution's allocation by a weight equal

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to the inverse of its selection probability,

$$W_i = 1/p(i)$$

Therefore, total need error for each program is

$$N = \sum_i \left(W_i (N_i' - N_i)\right)$$

and total absolute need error is the sum of the weighted institutional errors, disregarding their signs, or

$$|N| = \sum_i \left(W_i (|N_i' - N_i|)\right)$$

Changing the need elements in the allocation formulas has a domino effect which leads to changes in many of the other elements. Relative state need, for instance, is the institution's need divided by the sum of the needs for all institutions in the state, or

$$R_{im} = N_{im} / \sum_i N_{im}$$

where

R_{im} = relative need for institution i in state m

To hold the rest of the state constant, we divided the revised need by the state need adjusted for the change in need of the institution under consideration. Therefore

$$R'_{im} = N'_{im} / \left(\left(\sum_i N_{im} \right) + N'_{im} - N_{im} \right)$$

Institutions also receive adjustments to their allocations because some institutions do not get all the money to which they were entitled according to their relative need, because they were being penalized for excessive NDSL defaults or had not applied for their full entitlements. The calculations of these adjustments were not reflected in any of the allocation worksheets to which we had access. Therefore, we adjusted each

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revised allocation by the ratio between the institution's original allocation on the basis of its incorrect FISAP enrollment report (before adjustment) and its actual original allocation (after adjustment), or

$$X'_{1,i} = X'_{0,i}(X_{1,i}/X_{0,i})$$

where

X_i = allocation for school i

Subscript 0 indicates the allocation before adjustment, and subscript 1 indicates the allocation after adjustment.

To calculate total net error, Y, for a specific Campus-Based program, we multiplied the change in each institution's allocation by its weight, or

$$Y = \sum_i \left(W_i(X'_{1,i} - X_{1,i})\right)$$

We also calculated total gross error, the sum of the absolute allocation changes, or

$$|Y| = \sum_i \left(W_i(|X'_{1,i} - X_{1,i}|)\right)$$

3.2 Estimates of Need and Allocation Error

Table 2 shows our estimates of total error in need calculations, both net and absolute, arising from misreporting of enrollment on the FISAP. Net errors amount to only 1.2 percent of self-help need at institutions with error, and 17 percent of SEOG need at those institutions. Absolute error is 8.8 percent of self-help need and 19.4 percent of SEOG need. Because there was no national fair share money in any of the programs in 1983-84, ED did not calculate national need totals; therefore, we cannot relate these need errors to total need.

Table 3 shows our estimates of the total amount of allocation error, both net and absolute, with the number of institutions whose allocations were affected by FISAP errors and the magnitude of the error in relation to total allocations. Of the 23 schools that still had unresolved discrepancies in their FISAP enrollment reports after our visits, we could not find original FISAP's for 2. Therefore, we did not have the

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TABLE 2

ESTIMATES OF NEED ERROR

Need Type	Number of Schools	Total need Change ($ Thousands) Net	Absolute
SEOG Need	21	33,883	38,982
Self-Help Need	21	2,529	18,598

TABLE 3

ESTIMATES OF ALLOCATION ERROR

Program	Number of Schools With Error	Number of Schools With Allocation Change	Total Allocation Change ($ Thousands) Net	Total Allocation Change ($ Thousands) Absolute	Relative Allocation Change (Percent) Net	Relative Allocation Change (Percent) Absolute
CW-S	21[a]	15	-759	1,222	0.14	0.22
NDSL	18[ab]	13	+1,162	2,106	0.64	1.16
SEOG	21	8	-311	311	0.08	0.08
Total	**60**	**36**		**3,639**		**0.33**

[a]FISAP's were unavailable for two institutions; therefore, need could not be recalculated for CW-S and NDSL.

[b]Three schools did not participate in the NDSL program.

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detailed breakdown of eligible aid applicants by income which would needed to recalculate need.

Although all the institutions being considered here had FISAP errors which could have affected their allocations, overall only 60 percent of the allocations would have changed. Most of the institutions with errors but no allocation change were in states in which the conditional guarantees totalled more than the state's allocation; therefore, there was no state fair share money to distribute on the basis of aggregate need at individual institutions. One school had no NDSL allocation because of an excessive default rate; this situation was not changed by recalculation of the school's aggregate self-help need.

Total allocation errors, as estimated on the basis of the pilot Title IV quality control study were small in both absolute and relative terms. The sum of the weighted values of all allocation changes was negative for the CW-S and SEOG programs, indicating that the schools in error got more money than they should have; correction of these errors would have freed money for the institutions which did not misreport their enrollments. In the NDSL program, the sum of allocation changes was positive, indicating that these schools were underfunded as a result of their FISAP errors. The total amount of money in error--counting both positive and negative changes as errors in the same direction, rather than letting overallocations offset underallocations--was slightly over $1 million in the CW-S program, slightly over $2 million in the NDSL Program, and only about $300,000 in the SEOG program. In the three programs combined, only about $3,600,000 was misallocated as a result of FISAP enrollment error.

The right columns of Table 3 show that these misallocations involve only miniscule amounts in relation to the total allocations. The errors amounted to hardly more than 1 percent of NDSL Federal capital contributions, but to less than $1 for every $450 of CW-S subsidies and to about $1 for every $1250 in SEOG grants.

3.3 Analysis of Allocation Error

Not only was total allocation error small, but most allocations were unaffected by misreporting of enrollments on the FISAP. None of the 18 institutions for which

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we could calculate alloction changes in all three programs had no change in all three, but "Exemplar State College" can serve as an example of the several which had no changes in two programs.[1] Table 4 shows key allocation variables before and after correction. Exemplar reported 3,747 undergraduates on its FISAP but 4,614 in the HEGIS Fall Enrollment survey. Since total tuition and fees remained the same, the error increased average tuition and fees per student by 23 percent, a rather large difference. Because students are allowed $3200 per year for living expenses, the cost of education at this low-cost school was only raised it by 4 percent; however, this small change caused a 25 percent increase in SEOG need and a 54 percent increase in the self-help need used to calculate CW-S allotments. In both cases, the institution's "fair share" of the state allotment increased nearly proportionately. However, the sum of SEOG conditional guarantees for all schools in the state exceeded the state's SEOG allocation. Therefore, schools did not even get their full conditional guarantees and there was no money left over to allocate on the basis of need. Although Exemplar's allocation would have been less than its conditional guarantee using either enrollment datum, it would have received its guarantee if enough money had been available; thus its SEOG allocation would have been unchanged. The CW-S allocation worked out only slightly differently. Although there was money available to add to CW-S conditional guarantees in the state, Exemplar had no share in this money because even with its need exaggerated by the underreporting of its enrollment, its conditional guarantee exceeded its state fair share.

Exemplar State's NDSL allocation was affected, however. Like its relative state need for CW-S, its NDSL relative state need fell by 35 percent. The result of this change was a decrease in its overall lending ability shortfall (line 20 of Table 3) by 89 percent, as its conditonal guarantee for Federal capital contributions, plus funds from collections and the required institution matching, now nearly equalled the revised level-of-effort guarantee. Exemplar's share of the funds available in the state to meet these shortfalls fell the same 89 percent (line 22). Since the conditional guarantee did not change, the sum of the conditional guarantee and funds from the state fair share pool decreased by only 69 percent, still a substantial drop (line 23).

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[1] This is an actual case whose name we have disguised, not a hypothetical one or a composite of several institutions.

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TABLE 4

ALLOCATION EFFECTS OF FISAP ERROR
AT EXEMPLAR STATE COLLEGE

		Reported Data[a]	Best Data[b]	Percent Change
1.	Undergraduate Enrollment	3,747	4,614	23
2.	Average Tuition and Fees	$ 832	$ 676	23
3.	Cost of Education	$ 4,032	$ 3,876	4
	SEOG			
4.	Need	$1,179,622	$ 947,460	25
5.	Relative State Need	.0052245	.0042006	
6.	State Fair Share	$ 101,378	$ 81,510	24
7.	Conditional Guarantee	$ 155,180	$ 155,180	
8.	Funds for State Shortfalls	$ 0	$ 0	
9.	State Increase to Cond. Guar.	$ 0	$ 0	
10.	Allocation	$ 151,021	$ 151,021	0
11.	Self-Help Need	$1,700,701	$1,107,250	54
	CW-S			
12.	Relative State Need	.0066527	.0043413	35
13.	State Fair Share	$ 224,431	$ 146,457	53
14.	Conditional Guarantee	$ 244,618	$ 244,618	
15.	Funds for State Shortfalls	$1,811,463	$1,811,463	
16.	State Increase to Cond. Guar.	$ 0	$ 0	
17.	Allocation	$ 244,431	$ 244,431	0
	NDSL			
18.	Conditional Guarantee--FCC[c]	$ 9,229	$ 9,229	
19.	Relative State Need	.0067129	.0043807	35
20.	Inst. State Shortfall--LOE[d]	$ 87,293	$ 9,221	89
21.	Inst. Rel. State Shortfall--LOE[d]	.017140	.001?505	
22.	State Increase to Adjusted Conditional Guarantee--FCC[c]	$ 30,578	$ 3,264	89
23.	Conditional Guarantee and State Increase--FCC[c] (Allocation)	$ 39,807	$ 12,493	69

[a] Data reported by institution on FISAP or used by ED to calculate allocation.

[b] Data that should have been reported by institution or would have been used by ED if FISAP had been correct.

[c] Federal capital contribution--the amount which the Federal government will contribute to add to the institution's revolving fund.

[d] Level of Effort--total new loans to be made by the institution during the award year, from repayments of old loans, FCC, and institutions matching funds (10 percent of FCC).

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Exemplar State had a larger error in its original enrollment report than many of the 23 institutions being analyzed here. As the example demonstrates, such errors can be magnified greatly by the allocation formulas, but only if there is money in the state fair share pool to add to conditional guarantees.

Although other effects of FISAP errors may be greater, the errors we have been able to analyze here are so small that they should not be a subject of major concern. It is true that some institutions would get more or less money from at least one of the Campus-Based programs if every institution reported the correct number on the FISAP. However, our error estimates indicate that the average absolute allocation error for schools with FISAP enrollment errors was about $5,000 in the CW-S program, about $10,000 in NDSL Federal capital contributions, and about $1,200 in the SEOG program. Institutions which completed their FISAP's correctly would be affected much less, probably on the order of a few hundred dollars on average in the CW-S and NDSL programs a few tens of dollars in the SEOG program.

3.4 Institution Justifications and Comments

Since our data collection for this report included interviews with financial aid directors of sampled institutions at which they were asked to explain the discrepancies between FISAP and HEGIS enrollment data, we have a body of qualitative data which suggests some of the reasons for misreporting. At some institutions, the financial aid directors evidently did not agree that the enrollment data requested in the FISAP instructions accurately reflected their schools' "true" enrollments and so they submitted other figures. In other cases, the financial aid directors delegated the enrollment items of the FISAP to some other offices in the institutions' administrations, and did not know what figures their registrars, offices of institutional research, or whatever had entered. Our field staff did not have time for followup interviews in these cases to try to find out why these other administrators had not followed the instructions.

3.5 Recommendations

Although the enrollment reporting errors on the FISAP have only a slight effect on allocation of Campus-Based funds, ED could take one of three steps to reduce this

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particular problem:

- Clearer FISAP instructions
- Cross-source editing
- Cross-source data collection

Although the FISAP instructions are clear enough about transferring HEGIS data, specifying line numbers, it appears that some institutions do not realize the importance of repeating these numbers exactly. Therefore, they try to "improve" the accuracy of the data by using other figures. An explanation of how the numbers are used--that the enrollment data are used with the tuition and fees data to compute average tuition and fees--might reduce this source of error. In particular, pointing out the effects of adding to the numbers already reported to HEGIS--that this can reduce an institution's allocation--is likely to keep at least some institutions from losing funds in an honest but misguided effort to improve the accuracy of their FISAP's.

Routine cross-source editing--comparing the enrollment data that has been entered onto magnetic tape with the comparable HEGIS items--would reveal the same discrepancies for all institutions that file both reports as we were able to uncover through a manual comparison of the records for only 281 institutions. However, certain definitional problems could occur in comparing FISAP to HEGIS unless one of them were changed; see our report of August 1984, Improving Quality in the Application Portion of the Processing Fiscal Operations Report and Application to Participate: An Approach to Developing and Defining Edit Checks, page 19. This paper is attached as an appendix.

Cross-source data collection would be a step beyond cross-source editing. Given that the data on the FISAP discussed here are supposed to be the same as on HEGIS questionnaires, ED could take the data directly from HEGIS tapes for institutions which are part of HEGIS. Institutions should still be asked to enter these data on the FISAP for two reasons: first, the data would then be available as a backup to HEGIS; second, instructions to omit HEGIS data if the school is a HEGIS participant would probably lead to omission by some schools which are not part of HEGIS.

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The second and third steps would require some adjustment of either HEGIS or the FISAP. The most practical adjustment would probably be to compute the Campus-Based allocations from revised or updated HEGIS numbers rather than from the HEGIS data originally submitted. Theoretically, this step would produce better allocations since the revised data should reflect institutional enrollments more accurately than unrevised data. The allocation process would also have to be changed so that allocations were made to the same units or subdivisions, such as individual colleges or campuses, that file their own HEGIS reports.

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APPENDIX

IMPROVING QUALITY IN THE APPLICATION PORTION OF THE PROCESSING FISCAL OPERATIONS REPORT AND APPLICATION TO PARTICIPATE

AN APPROACH TO DEVELOPING AND REFINING EDIT CHECKS

August 1984

Submitted by:

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INTRODUCTION

Advanced Technology has conducted various analyses associated with the Fiscal Operations Report and Application to Participate (FISAP) in the Campus-Based student aid programs. These analyses are part of the Title IV Quality Control study that will assess for the Division of Quality Assurance (DQA), Office of Student Financial Assistance (OSFA) the quality of delivery of Campus-Based student aid funds to students enrolled at institutions participating in the three Campus-Based programs.

The first activity of the FISAP analysis involved data collection at the Department of Education (ED). Advanced Technology data collectors conducted a series of manual edits for the 275 institutions participating in the Campus-Based programs that were sampled for the Spring 1984 Title IV Quality Control data collection.

These edits included cross-year comparisons of FISAP data elements and cross-data source comparisons with the Pell Grant Disbursment System file and Higher Education General Information Survey (HEGIS) files. Institutions that were found to have discrepancies in FISAP data elements were identified for further data retrieval. The results of this first activity are contained in a report entitled "Analysis of Error Associated with the Application and Allocation Aspects of the Campus-Based Programs: Results from Initial Collection," submitted to DQA in May 1984.

The second activity consisted of a supplemental FISAP data collection conducted during the Title IV data collection at those institutions identified through the manual edits described above. Financial aid administrators and registrars were asked to resolve extant discrepancies. These data are still being analyzed and a report will be produced in the next several months.

The focus of this report is the recommendation of edits that can be performed on the application portion of the FISAP by the processor including recommended initial tolerances for these edit checks. However, since these tolerances have been developed through qualitative analytic methods and since data are currently unavailable with which to establish tolerances through quantative methods, the report also proposes a longer-term approach to assessing the efficacy of recommended edit checks, the adequacy of recommended tolerances. This approach also includes

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developing a data gathering and analysis plan for analyzing the validity of potential edits and reasonable tolerances for these edits.

Background and Nature of the Problem

The application and funding process for the three Campus-Based programs, College Work-Study (CW-S), National Direct Student Loan (NDSL), and Supplemental Educational Opportunity Grants (SEOG) is complex, time-consuming, and potentially error prone. Campus-Based student financial aid funds are allocated to participating institutions in each state by a process in which the overall financial need of students at one eligible institution is compared to the need of students attending other applicant institutions in that state and in the nation as a whole. For both the NDSL and CW-S programs, an institution receives an allocation computed in three general stages from data filed by institutions on the application portion of the FISAP:

(1) A conditional guarantee

(2) A state increase based on its "fair share" of the state apportionment

(3) A national increase based on its "fair share" of the national appropriation.

For SEOG, the allocation is computed in four general stages (for previous program participants):

(1) A conditional guarantee

(2) An initial year (IY) state increase based on its "fair share" of the state's IY apportionment

(3) An IY national increase based on its "fair share" of the national IY portion of the SEOG appropriation

(4) A continuing year (CY) national increase based on its "fair share" of the national CY portion of the SEOG appropriation.

Through more than a decade of evolution the attempts to increase the validity of application forms and ensure more accurate and more equitable distribution of funds have complicated the application as well as application processing. The potential for errors by the institutions and the processing system has also increased. This increase in complexity and resultant increases in the opportunity for error, combined with an

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increasing number of participating institutions (currently over 4,000), have caused a good deal of attention to be focused on FISAP processing by OSFA and others.

This report focuses on one area that continues to receive attention, namely, the accuracy of data submitted by institutions on the application portion of the FISAP. These data are critical since they determine, to a degree, the institutions' funding level for each of the Campus-Based programs.

Application Processing

A major area of OSFA concern relates to the computerized processing of the FISAP by the contractor which produces an institution's initial allocation. The allocation is based on the funding formula, current regulations, and the program appropriations. Last-minute changes to regulations and delays in receiving the appropriations result in last-minute modifications to program modules in the processing system. Edit checks must be modified to accomodate these changes, potentially resulting in processing delays. While such modifications cannot be controlled, they must be considered in developing an approach to systematic application edit checks.

Ideally, institutions would like to know in January how much money will be available to award to students for the following academic year. In recent years many institutions have not received a final allocation before awarding aid to students. In part this delay has been caused by the last-minute nature of the changes noted above and delays in the funding process. However, when considering a comprehensive system of edit checks, care must be taken in order not to overburden a large number of institutions with error messages and correction requests which would slow corrections and processing required to produce the final allocation. Such edits can quickly reach the point of diminishing return.

Follow-up Procedures

Once schools have received error messages noting specific line items on the FISAP which failed to pass system edit checks, it is their responsibility to make the necessary corrections and forward the corrected items to OSFA for reprocessing. Although certain uncorrected items will trigger a flag in the system and the institution

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will be put on "hold," other correction failures go through the system and still permit an institution to receive an initial award. In some cases that initial allocation is in error and the institution unknowingly awards funds it is not entitled to award. Inability of OSFA to follow up the status of corrections and appeals to initial allocations is due in large part to insufficient staff to track corrections and appeals which annually come from an increasing percentage of over 4,000 schools participating in the program. System tracking procedures for corrections submitted for reprocessing (e.g., aging reports) and prompt resolution of allocations for "hold" institutions are support follow-up procedures which are contractor responsibilities. Each of these areas affects the quality and integrity of the FISAP process and is another aspect of OSFA concern. This report deals in a limited manner with these areas.

GENERAL APPROACH TO DEVELOPING EDIT CHECKS

The Campus-Based processor's draft quality control plan identifies 109 edit checks for the FISAP. However, only 13 of these edits relate to the application portion of the FISAP. In addition, these edits are restricted primarily to internal arithmetic and consistency tests.

The edit checks recommended in this report include several additional internal edits. Also recommended are cross-year edits checks and cross-data source edits checks using Pell and HEGIS data.

Fundamental Design Principles

The development of the series of edit checks enumerated in the following sections is based on several principles which focus on the inherent qualities of an effective quality control system for the application portion of FISAP and its relationship to the Campus-Based delivery system, particularly the capabilities of the two main actors, institutions, and ED. The principles embodied in our approach include:

- Comprehensiveness
- Efficiency
- Congruity

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- Verifiability

Comprehensiveness as a design principle ensures that all meaningful edits will be conducted and all possible data sources will be utilized. Efficiency has more dimensions as a design principle. The first dimension considers the capability of the system to discriminate between erroneous data and reasonable year to year changes in data that often occur at institutions subject to dynamic circumstances. A system of edit checks must be able to identify large numbers of errors in a systematic rather than random fashion and to target error prone cases.

The second dimension of the efficiency principle is the ability to elicit changes in data elements from institutions and to track and incorporate these changes into the processing system expeditiously. Consequently, neither an inordinately large number of edits nor an unnecessarily large number of cases, as discussed above, should be produced. Either condition would have adverse impacts on institutions and the ED staff and processor.

The next design principle is congruity, which implies that the treatment assigned relates directly to the importance of the data item and the reliability of the data sources and tolerance levels used in the edits. The last design principle is to maximize the number of edits that have directly verifiable information.

Approach

A two staged approach to developing an effective set of edit checks is proposed. This approach is proposed for two reasons. First, as our prior reports indicated, there is no clear definition or determination of what constitutes an error. Second, a preliminary analysis of our data collection at institutions raised significant questions about direct comparability of certain types of comparison data. This would suggest that more detailed analysis is required.

The first stage consists of a thorough review of the current edits and the application document in order to develop, evaluate, and recommend edit checks for implementation for this processing year. Potential edits were also identified, but are not recommended for implementation this year. Rather they are recommended for further analysis and implementation during the next processing year. Initial tolerance

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levels are recommended for this processing year. These were developed through qualitative analysis, including analysis of edit tolerance structures and levels used in other processing systems. First stage activities included the following:

- Review processor's draft QC plan
- Analyze other processing systems
- Analyze proposed edits and the application document
- Review edits proposed in the QC plan, as well as omissions
- Develop comprehensive list of potential edits
- Identify data sources
- Develop initial tolerances
- Identify edits to recommend for further analysis and possible implementation during 1984-85 processing year.

The results of this phase are presented in the next section. Briefly, the results include additional internal edits not covered in the QC plan; internal or external data sources for each of the 24 edits developed, and a tolerance structure that is sensitive both to magnitude of the change in data elements and the reliability of the data sources used for comparison.

The second phase of the proposed approach has two objectives and achieves these through developing an analysis plan and conducting longer term analysis. The first of these objectives is to refine the tolerance levels based on current processing year performance and cross year analysis. Measures of performance could include the rate of edit failure, magnitudes and frequencies of corrections.

The second objective concerns the collection and analysis of data with which to assess the feasibility of edits proposed in the following section but not recommended for implementation during this processing year. In addition, analysis will be conducted to identity additional edits or more elegant and efficient means of conducting edits. The approaches that will be investigated include error prone selection and multi-level edits. Multi-level edits could include sequencing edits so that an application that fails an initial edit would be subject to a battery of other edits to attempt to determine

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whether the data are the result of legitimate changes in characteristics or actual errors. The feasibility of multi-level treatment for edit failures must also receive careful attention. For instance, small changes, even though they are suspected to be in error can simply be flagged and process may continue. However, errors of large magnitudes or patterns may require putting an application on hold.

We propose to submit such an analysis plan in 60 to 90 days.

DESCRIPTION OF POTENTIAL FISAP EDITS

The optimum machine editing system for processing the application portion of the FISAP should perform three functions. The system first must ensure that data reported on the FISAP is internally consistent. Checks should be made to make certain that the respondent's arithmetic is correct, that all required entries have been made, and that the relationships between data are logical. Second, since institutions annually submit the FISAP, the editing system should ensure the cross-year consistency of data. Most data elements on the FISAP should not change dramatically from year-to-year. Inasmuch as the prior year FISAP files can be considered "clean," they should be considered as a good base for evaluating values on the current year FISAP. Finally, the optimum editing system should ensure the consistency of FISAP data with other higher education data collected by the Department of Education. The Pell Grant Disbursement System and HEGIS, for instance, collect some data which are definitionally consistent with data collected on the FISAP.

Figure 1 shows the 13 edit checks currently used on the application portion of the FISAP. As the figure shows, the current edits address only the internal consistency of FISAP data. As such, the current editing system is limited in the kind of errors and inconsistencies it can detect. A FISAP form, for example, may have data which is internally consistent--and, therefore, judged "clean" by the current system--yet have errors which have a direct and possibly significant impact on the distribution of Campus-Based aid.

Experience conducting manual validation of FISAPs from 275 sampled institutions has suggested 24 specific edit checks that should be considered for incorporation in the FISAP application editing system. The 24 edits which are specified in Figure 2

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1. Institutions with expended funds in the fiscal operations report year must designate a request for funds for the upcoming award year on page 11, section A, lines 1, 2, 3, 4, or 5.

2. Total expenditures on page 11, line 13 must equal the sum of the individual expenditures in lines 10, 11, and 12.

3. The NDSL FCC request, page 11, section A, line 2 must be less than the NDSL LOE request, page 11, section A, line 1.

4. When tuition revenue is on page 13, section E, line 15, column a, enrollment data must be entered on section G, line 36, column a, or lines 39 through 51, column a.

5. When tuition revenue is on page 13, section E, line 15, column b, enrollment data must be entered on section G, line 37, column b, or lines 39 through 51, column b.

6. Total dependent undergraduate eligible aid applicants on page 13, section F, line 35, column a, must equal the sum of lines 19 through 34, column a.

7. Total dependent graduate/professional eligible aid applicants on page 13, section F, line 35, column b must equal the sum of lines 19 through 34, column b.

8. Total independent undergraduate eligible aid applications on page 13, section F, line 35, column c, must equal the sum of lines 19 through 34, column c.

9. Total independent graduate/professional eligible aid applicants on page 13, section F, line 35, column d must equal the sum of lines 19 through 34, column d.

10. When total number of students is entered on page 13, section G, line 36, columns a or b, there must be no entries in lines 39 through 51, columns a and b.

11. When page 13, section G, has entries shown in lines 39 through 51, there must be no entries shown in section F, lines 19 through 35, columns b and d, and in section G, line 36, column b.

12. Total non-traditional continuing students on page 13, section G, line 51, column a must equal the sum of lines 39 through 50, column a.

13. Total non-traditional new starts on page 13, section G, line 51, column b must equal the sum of lines 39 through 50, column b.

FIGURE 1

DESCRIPTION OF CURRENT EDIT CHECKS
ON THE APPLICATION PORTION
OF THE FISAP

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A. INTERNAL CONSISTENCY CHECKS

	Data Elements	Section and Line Number References	Test/Error Condition
1.	• Pell Grant Expenditures	E16	If Pell Grant expenditures were reported in E16 then data for dependent or independent undergraduates must be reported in F35.
	• Undergraduate Dependent Applicants	F35	
	• Undergraduate Independent Applicants	F35	
2.	• Undergraduate Dependent Applicants	F35	The sum of dependent and independent undergraduates reported in F35 must be less than or equal to the undergraduate enrollment reported in G36a or the sum of continuing and new enrollment reported in G51a and G51b.
	• Undergraduate Independent Applicants	F35	
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
3.	• Graduate Dependent Applicants	F35	The sum of dependent and independent graduates/professionals reported in F35 must be less than or equal to the graduate/professional enrollment reported in G36b.
	• Graduate Independent Applicants	F35	
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM

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B. CROSS-YEAR CONSISTENCY CHECKS

	Data Elements	Section and Line Number References	Test/Error Condition
1.	Institutional Grant Expenditures for Award Year 1977-78	E18	Institutional grant expenditures must equal corresponding data from last year's form.
2.	Undergraduate Tuition and Fees	E15a	Current year total undergraduate tuition and fees will be compared with corresponding data from last year's form. The current year data must be within the following tolerances which vary according to the level of last year's data:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 499,999	± 60% of last year's data
500,000 - 999,999	± 50% of last year's data
1,000,000 - 9,999,999	± 40% of last year's data
10,000,000 - 19,999,999	± 30% of last year's data
20,000,000 and above	± 20% of last year's data

3.	Graduate Tuition and Fees	E15b	Current year total graduate tuition and fees when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 499,999	± 60% of last year's data
500,000 - 999,999	± 50% of last year's data
1,000,000 - 9,999,999	± 40% of last year's data
10,000,000 - 19,999,999	± 30% of last year's data
20,000,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
4.	Pell Grant Expenditures	E16	Current year Pell Grant expenditures when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 99,999	± 60% of last year's data
100,000 - 499,999	± 50% of last year's data
500,000 - 999,999	± 40% of last year's data
1,000,000 - 4,999,999	± 30% of last year's data
5,000,000 and above	± 20% of last year's data

5.	State Grant Expenditures	E17	Current year state grant expenditures when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 99,999	± 60% of last year's data
100,000 - 499,999	± 50% of last year's data
500,000 - 999,999	± 40% of last year's data
1,000,000 - 4,999,999	± 30% of last year's data
5,000,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
6.	• Undergraduate Dependent Applicants • Undergraduate Independent Applicants	F35 F35	The sum of dependent and independent undergraduates for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

	Data Elements	Section and Line Number References	Test/Error Condition
7.	• Graduate Dependent Applicants • Graduate Independent Applicants	F35 F35	The sum of dependent and independent graduates for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
8.	Undergraduate Enrollment -- Traditional	G36a	Current year undergraduate enrollment when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

9.	Graduate Enrollment	G36b	Current year graduate/professional enrollment when compared with corresponding data from last year's must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
10.	• Continuing Enrollment -- Nontraditional	G51a	The sum of continuing and new enrollment for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:
	• New Enrollment -- Nontraditional	G51b	

Level of Last Year's Data			Tolerance Ranges for This Year's Data
0	-	99	± 60% of last year's data
100	-	499	± 50% of last year's data
500	-	999	± 40% of last year's data
1,000	-	4,999	± 30% of last year's data
5,000	and above		± 20% of last year's data

11.	• Total Undergraduate Tuition and Fees	E15a	If total undergraduate tuition and fees increase by more than 10% when compared with last year's data, undergraduate enrollment in traditional institutions or the sum of continuing and new enrollment in nontraditional schools must not decrease by 10% or more.
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
12.	• Total Graduate Tuition and Fees	E15b	If total graduate tuition and fees increase by more than 10% when compared with last year's data, graduate enrollment must not decrease by 10% or more.
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
13.	• Total Undergraduate Tuition and Fees	E15a	If total undergraduate tuition and fees decrease by more than 10% when compared with last year's data, undergraduate enrollment in traditional institutions or the sum of continuing and new enrollment in nontraditional schools must not increase by 10% or more.
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
14.	• Total Graduate Tuition and Fees	E15b	If total graduate tuition and fees decrease by more than 10% when compared with last year's data, graduate enrollment must not increase by 10% or more.
	• Graduate Enrollment	G36b	
15.	• Pell Grant Expenditures	E16	If Pell Grant expenditures increase by 10% or more when compared with last year's data, the sum of dependent applicants with incomes below $26,999 and independent applicants with incomes below $8,999 must not decrease by 10% or more.
	• Dependent Undergraduate Applicants with Incomes From $0 - $26,999	F19 through F27	
	• Independent Undergraduate Applicants with Incomes From $0 - $8,999	F19 through F27	
16.	• Pell Grant Expenditures	E16	If Pell Grant expenditures decrease by 10% or more when compared with last year's data, the sum of dependent applicants with incomes below $26,999 and independent applicants with incomes below $8,999 must not increase by 10% or more.
	• Dependent Undergraduate Applicants with Incomes From $0 - $26,999	F19 through F27	
	• Independent Undergraduate Applicants with Income From $0 - $8,999	F19 through F27	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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C. CONSISTENCY CHECKS WITH OTHER DATA BASES

	Data Elements	Section and Line Number References	Test/Error Condition
1.	• Total Undergraduate Tuition and Fees	E15a	The sum of total tuition and fees for undergraduates and graduates must not differ by plus or minus 10% when compared with comparable data on Part A, Line 1 of HEGIS' Financial Statistics Survey.
	• Total Graduate Tuition and Fees	E15b	
2.	Pell Grant Expenditures	E16	Pell Grant expenditures must not differ by plus or minus 10% when compared against comparable data on the Pell Grant Disbursement System's Universe File.
3.	• Undergraduate Enrollment -- Traditional	G36a	The sum of undergraduate and graduate enrollment must not differ by plus or minus 10% when compared with the sum of lines 1, 10, 11, 15, 24, and 25 from columns 13 and 14 of HEGIS's Fall Enrollment Survey.
	• Graduate Enrollment	G36b	
4.	• Type of Institution	A4	If the institution is private, nonprofit, the ratio of undergraduate enrollment to total undergraduate tuition and fees must not differ by more than plus or minus 25% when compared with undergraduate tuition and fees reported on HEGIS' Institutional Characteristics Survey.
	• Total Undergraduate Tuition and Fees	E15a	
	• Undergraduate Enrollment	G36a	
5.	• Type of Institution	A4	If the institution is private, nonprofit, the ratio of grad-enrollment to total graduate tuition and fees must not differ by more than plus or minus 25% when compared with graduate tuition and fees reported on HEGIS' Institutional Characteristics Survey.
	• Total Graduate Tuition and Fees	E15b	
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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address all three edit check functions: additional internal consistency checks, cross-year comparisons, and comparisons with other higher education data files. Figure 2 describes each of the proposed edits, provides the data elements which each edit addresses, and references the section and line number of the data element on the form. As Figure 2 indicates, the proposed edits address only those data items in Sections E, F, and G on the application portion of the FISAP which are critical in determining an institution's need for Campus-Based aid.

Proposed Internal Consistency Checks

Three edits which would check to make sure that the relationships between certain data items are logical are proposed. The first edit would ensure that when Pell Grant expenditures are reported in Section E, a figure for total undergraduate eligible aid applicants is also reported in Section F. The second two edits would make sure that the number of eligible aid applicants reported in Section F is less than or equal to the institution's total Fall enrollment reported in Section G.

Recommendation

We recommend that OSFA incorporate these three internal consistency checks into the FISAP editing system for the upcoming processing year. The three edits address Pell Grant expenditures, number of aid applicants, and total enrollment, three data elements which our field work suggests are among the most often misreported. The three edits, by checking the consistency of the three data elements, would uncover misreporting that the current system is not capable of identifying.

Proposed Cross-Year Consistency Checks

Sixteen edits which check an institution's cross-year reporting consistency are proposed. In the first edit, a cross-year comparison is made with not tolerance provided. In the next 9 edits, a critical item is compared cross-year using a tolerance range. If the values of the two items being compared fall within the tolerance range, the item would not be considered in error. The proposed tolerance ranges are expressed as proportions of current year data to last year's data. For example, if an institution reported 80 for its undergraduate enrollment last year its tolerance would

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be plus or minus 60 percent. Its tolerance range for this year's data would be 32 (80 - (.60 x 80) = 32) to 128 (80 + (.60 x 80) = 128). The tolerances vary depending on the amounts reported on last year's form. Ranges are broader for small amounts and more restrictive for large amounts since significantly more cross-year variation should be expected at small institutions.

Extensive quantitative analysis of trends in FISAP reporting and the possible impact of various tolerance ranges on the frequency of edit failures was not possible due to the limited scope of the task. Instead, the proposed tolerance ranges were assigned based on experience doing manual cross-year comparisons on 275 samples FISAPs and on a review of cross-year edits used by the HEGIS surveys. The HEGIS program has been using cross-year comparisons for several years and as a result has been able to follow trends and refine the tolerance ranges it uses.

The final six cross-year consistency checks examine the relationship of change in two or more data elements. In four of the edits, change in total tuition and fees is compared to change in total enrollment (e.g., if total tuition and fees increase by more than 10 percent, then enrollment should not decrease by more than 10 percent). In the other two edits, change in total Pell Grant expenditures is compared to change in the total number of low income eligible aid applicants (e.g., if Pell Grant expenditures increase by 10 percent or more, the number of low income applicants should not decrease by 10 percent or more). A tolerance range of 10 percent has been used in these comparisons since the relationship between the data elements is not perfect. For instance, it is possible for total Pell Grant expenditures to rise and the number of low income applicants to drop due to an increase in tuition and fees or a change in the Family Contribution Schedule. Likewise, enrollment may drop and total tuition and fees rise due to an across-the-board increase in tuition.

Recommendation

We recommend that OSFA incorporate the 16 cross-year checks on a test basis during the upcoming year recognizing that the proposed tolerance ranges were developed through qualitative analytic methods and that additional analysis will be needed to refine them. This analysis should be conducted on an ongoing basis in order that this refinement continue and the tolerance not become outmoded.

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Proposed Consistency Checks With Other Data Bases

Five edits are proposed which would compare critical data elements from the FISAP with data collected by HEGIS and the Pell Grant program. Tolerance ranges are recommended for the comparisons to account for the following two problems in validating FISAP data with other data sources:

- **Ongoing changes to the Pell Universe and HEGIS files.** The figure for Pell Grant expenditures on the FISAP may not match what the Pell Universe File contains for either current authorization or net expenditures because of an onging reconciliation process that continues for months after the award year. Also, as part of the editing process the HEGIS files are revised over a period of several months following the original submission of the HEGIS form.

- **Definitional Differences.** In two of the proposed edits, an average tuition and fees figure would be calculated (total tuition and fees divided by enrollment) and compared against a tuition and fees figure reported for private institutions on HEGIS' Institutional Characteristics Survey.* That survey, however, asks for the modal (most common) tuition and fees rather than the campus-wide average. Thus, a rather liberal tolerance of 25 percent is suggested in making the comparison.

Recommendation

We recommend that ways of overcoming the problems we identified in the manual validation of 275 sampled forms be explored before incorporating comparisons with outside data bases into the current editing system. These problems, in addition to the two comparison problems already noted, include:

- **Difficulty of Identifying Institutions.** The HEGIS and FISAP files have no common identifier for the institution other than its name. HEGIS uses the FICE code as the numeric identifer for its institutions, while FISAP uses the entity number.

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*There is not comparable data for total public institution tuition and fees on the Institutional Characteristics Survey. Data is collected on that survey for in-state and out-of-state tuition and fees for public institutions. Without data on in-state and out-of-state enrollments, it is impossible to calculate a campus-wide average tuition and fees figure.

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- **Different Reporting Units.** The definition of a reporting unit is different for FISAP, Pell, and HEGIS. A multi-campus institution, for example, may file a single combined report for FISAP and separate reports for Pell.

- **Different Number of Reporting Units.** Not all institutions who file a FISAP file Pell and HEGIS reports. For example, there are many proprietary schools who file the FISAP form but not the HEGIS surveys.

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